Utility Cost Avoidance Electricity

Average Electric Utility cost 2003

- Commercial kW <$.04
- Peak charges were not always assessed in the rate structure and were never more than the base load.
- Use less in shoulder months pay less
- EPA compliance cost were nominal post Clean Air Act in 1980

Average Electric Utility cost 2014

- Commercial kW >$.11
- Peak charges are assessed on almost all rates and often total more than base due to ratchet rate structures.
- No relief during shoulder months due to ratchet 60%-75%
- EPA compliance are expected to go up exponentially.

Commonwealth Energy Management and Control System

Endeavor to gain a complete understanding of the energy consumed to operate all State facilities…every minute of every day. Create a data rich environment and use that data to reduce the Commonwealth's footprint.

MANAGEMENT & CONTROL SYSTEM

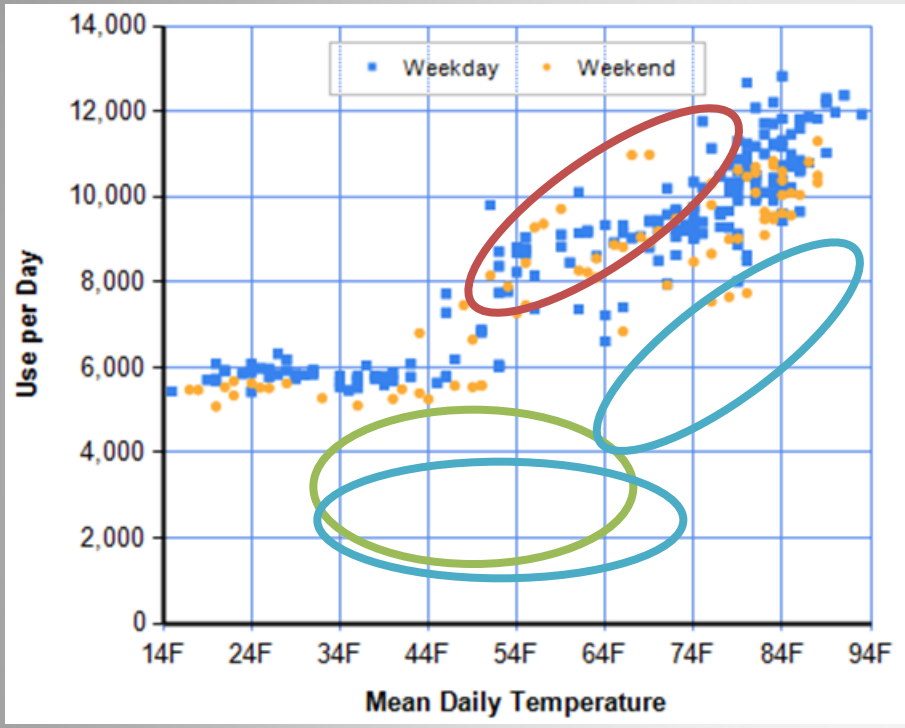
CEMCS

CEMCS: Four Major Developments

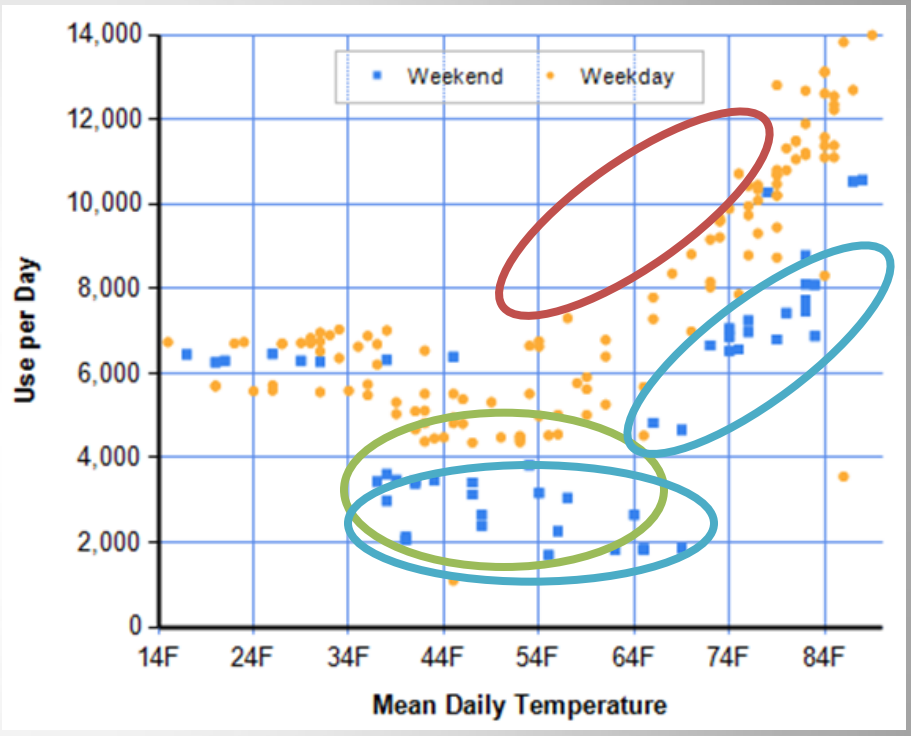
- Automated Utility Bill Paying (Centralized?)
  - Electronic Data Interchange (EDI) will be developed by Utility providers and fed into CEMCS for usage and payment.
- Utility Monitoring and Analysis
  - Monthly bill analysis, interval data, rate structure verification.
- Building Automation Integration and Diagnostics
  - BAS output data in SQL will be analyzed for sequence of operations
- Work Order Generation and Tracking
  - Each agency may have different CMMS; CEMCS will attempt to notify designated contacts of issues that need attention.

Finance Cabinet Building

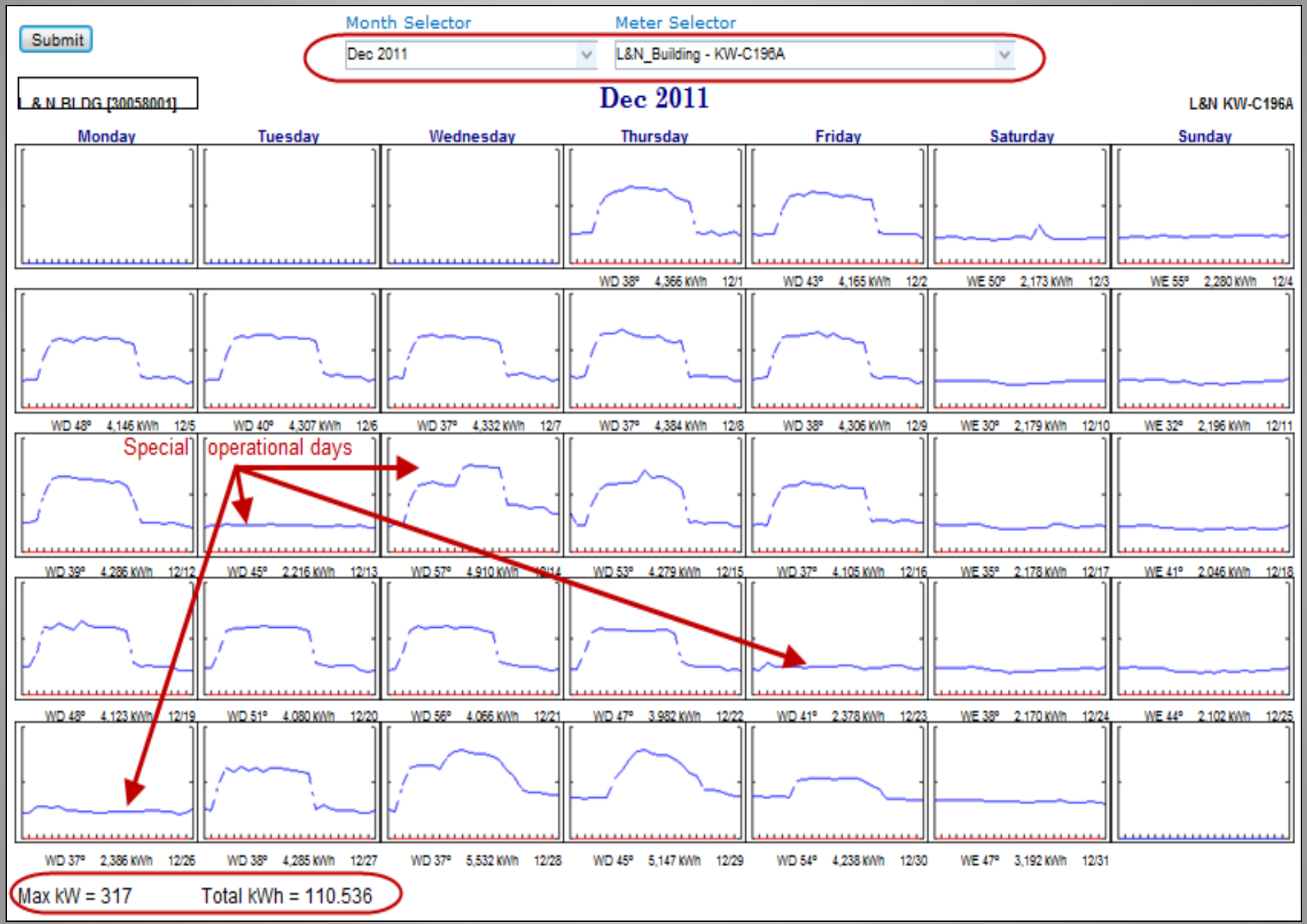
Before



After



- Weekends clearly lower daily energy consumption
- Noticeably lower consumption between 40F and 65F
- Noticeably lower consumption between 54F and 74F
- **Approximately $140-$200/day less expensive on weekends**
  - **≈ 2,000 kWh consumption per day**


Submit
Month Selector
Meter Selector
Dec 2011
L&N_Building - KW-C196A
L & N BLDG [30058001]
Dec 2011
L&N KW-C196A
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
WD 38° 4,366 kWh 12/1
WD 43° 4,165 kWh 12/2
WE 50° 2,173 kWh 12/3
WE 55° 2,280 kWh 12/4
WD 48° 4,146 kWh 12/5
WD 40° 4,307 kWh 12/6
WD 37° 4,332 kWh 12/7
WD 37° 4,384 kWh 12/8
WD 38° 4,306 kWh 12/9
WE 30° 2,179 kWh 12/10
WE 32° 2,196 kWh 12/11
Special
operational days
WD 39° 4,286 kWh 12/12
WD 45° 2,216 kWh 12/13
WD 57° 4,910 kWh
WD 53° 4,279 kWh 12/15
WD 37° 4,105 kWh 12/16
WE 35° 2,178 kWh 12/17
WE 41° 2,046 kWh 12/18
WD 48° 4,123 kWh 12/19
WD 51° 4,080 kWh 12/20
WD 56° 4,066 kWh 12/21
WD 47° 3,982 kWh 12/22
WD 41° 2,378 kWh 12/23
WE 38° 2,170 kWh 12/24
WE 44° 2,102 kWh 12/25
WD 37° 2,386 kWh 12/26
WD 38° 4,285 kWh 12/27
WD 37° 5,532 kWh 12/28
WD 45° 5,147 kWh 12/29
WD 54° 4,238 kWh 12/30
WE 47° 3,192 kWh 12/31
Max kW = 317
Total kWh = 110.536

http://kyenergydashboard.ky.gov

Tier Level Determines Payback

- **Tier 1-** Buildings, utility accounts and meters are verified and entered into the CEMCS. Rate structure analysis, benchmarking. Savings are usually 3%-8%.
- **Tier 2-** Tier one mandatory, interval data is added at a sample rate of 15 minutes 24/7/365 to gain an understanding about usage patterns. 5%-10%.
- **Tier 3-** Tier 1 mandatory. Building automation integration is added. All building trend points are captured every 5 minutes. Complete sequence of operations are analyzed and modified as comfort and energy allow. CEMCS reviews and recommendations are base on ASHRAE 62.1. This is complicated and costly but the returns are usually 8%-15%.
- Full implementation and remediation should pay back in less than 6 years. 2 year payback is possible.

How the numbers should work?

- Total cost of implementation averages approximately $.30-$.40 per foot.
- Return on Investment is approximately 16%-22%.
- Quick math, $2 per sqft x 200,000 sqft = $400,000 per year.
- $400,000 x .75 (25% savings) = $300,000
- Cost avoidance $100,000 per year